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Pulse-Width-Modulated Servo Valve for Autopilot System

A new servo valve has been developed for an autopilot wing-leveler system. The valve is to be used in light, single-engine aircraft. It is one of the advanced fluidic components developed at the Langley Research Center for aviation instrumentation and control.

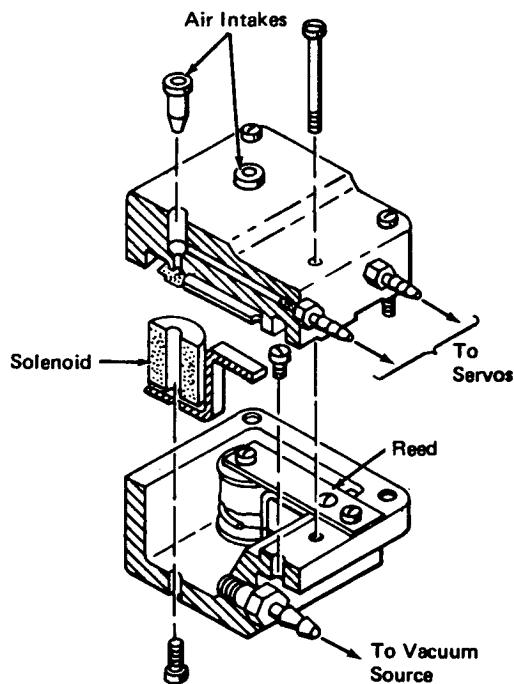
The valve as shown in the illustration serves as an interface between the electronic circuit of the wing-leveler system and the pneumatic servos which control the ailerons. Basically, the valve is controlled by the electronic circuit which feeds pulse-width-modulated correction signals to the two solenoids. Each solenoid moves a flexible steel reed. The two reeds alternately control the application of vacuum or atmospheric pressure to the respective pneumatic servos. Each of the two servos then moves an aileron in each wing, to level the aircraft. The servo operation is pseudolinear, with the pulse-width modulation being at about 20 Hz.

The reed valves are designed to act as jet pumps or ejector nozzles when open, so that the vacuum applied to the servo can be as much as twice that of the vacuum source. This feature allows the use of smaller servos with any given vacuum source.

The valve housing is cast from plastic, making it very economical to fabricate. The mechanism is simple, with the reeds being the only moving parts of the valve. Since the impact of the reeds is absorbed by silicone rubber pads, wear is negligible.

Note:

Requests for further information may be directed to:
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Pulse-Width-Modulated Servo Valve

Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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